

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

2

Docket No.: 80315(302753)

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AMENDMENTS TO THE SPECIFICATION

On page 1, line 6, please amend the subtitle as follows:

~~--TECHNICAL FIELD OF THE INVENTION--~~

On page 1, line 12, please amend the subtitle as follows:

~~--BACKGROUND DESCRIPTION OF THE RELATED ART--~~

On page 1, lines 13 - 28, please amend paragraph [0002] as follows:

--[0002] In a technical field related to electrical characteristic inspection for semiconductor integrated circuits, a technique has been known which concerns a conductive contact unit including a plurality of conductive contacts arranged correspondingly to external connection electrodes of a semiconductor integrated circuit. Such a conductive contact unit includes a plurality of conductive contacts, a conductive contact holder with openings for accommodating the conductive contacts, and an inspection circuit electrically connected to the conductive contact. To electrically connect a plurality of external connection electrodes to the inspection circuit while absorbing convex and concave ~~or the like~~ shapes present between the external connection electrodes in a semiconductor integrated circuit, the conductive contact needs to be contractible and ~~extensible~~ extendable.--

On page 2, line 33, please amend the subtitle as follows:

~~--DISCLOSURE SUMMARY OF THE INVENTION--~~

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

3

Docket No.: 80315(302753)

On page 3, line 1, please delete the subtitle as follows:

~~--PROBLEM TO BE SOLVED BY THE INVENTION--~~

On page 3, lines 2 - 6, please amend paragraph [0006] as follows:

--[0006] However, the conventional conductive contact shown in Fig. 8 has problems in that it is not easy to manufacture, especially the barrel 102, and difficult to reduce manufacturing cost. The problems will be described in detail below.--

On page 4, lines 10 - 28, please amend paragraph [0009] as follows:

--[0009] In addition, the member to be processed needs to be once released from the fixed state to change the direction, which causes axis deviation of the barrel 102 to be formed. In other words, as shown in Fig. 8, the barrel 102 has a rotational symmetry shape, theoretically, with respect to its longitudinal direction as an axis. A holder or the like for accommodating the plunger 101, the spring 103, and the conductive contact is designed based on such a shape. Consequently, when the manufacturing process is performed while the central axis of the hollow portion 110 and the contact member 108 is deviated from the designed one, trouble is caused in extension and contraction movement as the entire conductive contact, and also, sufficient electrical contact cannot be achieved with the inspection circuit or the like. Therefore, when the barrel 102 is manufactured by general machinery, accurate axis alignment is required for refixing the member to be processed, which necessitates complication in the manufacturing process.--

On page 5, line 9, please delete the subtitle as follows:

~~--MEANS FOR SOLVING PROBLEM--~~

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

4

Docket No.: 80315(302753)

On page 5, lines 10 - 22, please amend paragraph [0012] as follows:

--[0012] To solve the problems described above and achieve the object, according to claim 1, a needle-like member forming a conductive contact which electrically connects a to-be-contacted body to a circuit for generating and transmitting an electrical signal to be supplied to the to-be-contacted body or to a circuit board including the circuit, includes a contact member in which a portion coming in contact with the to-be-contacted body during use is processed into a predetermined shape, and a columnar member that is integrally formed with the contact member, and is formed with a through hole having a constant inner diameter or an inner diameter monotonically decreasing with distance from the contact member.--

On page 5, lines 23 - 28, please amend paragraph [0013] as follows:

--[0013] ~~According to claim 1, the~~ The through hole formed in the needle-like member is penetrated. Therefore, in the process of manufacturing the needle-like member, the contact member and the through hole can be formed from the same direction. Thus, it is possible to realize a needle-like member which can be manufactured in a simple manner.--

On page 5, lines 29 - 33, please amend paragraph [0014] as follows:

--[0014] ~~According to claim 2, in~~ In the needle-like member according to claim 1, the contact member is may be formed near a peripheral portion of the columnar member in a longitudinal direction to come in contact with a peripheral portion of a connecting electrode of the to-be-contacted body during use.--

On page 6, lines 1 - 21, please amend paragraph [0015] as follows:

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

5

Docket No.: 80315(302753)

--[0015] ~~According to claim 3, a~~ A conductive contact which electrically connects a to-be-contacted body to a circuit for generating and transmitting an electrical signal to be supplied to the to-be-contacted body or to a circuit board including the circuit, includes a first needle-like member including a contact member that comes in contact with one of the to-be-contacted body, and the circuit or the circuit board during use, and in which a portion coming in contact with the to-be-contacted body is processed into a predetermined shape, and a columnar member that is integrally formed with the contact member, and is formed with a through hole having a constant inner diameter or an inner diameter monotonically decreasing with distance from the contact member, a second needle-like member that is arranged to be electrically connected to the first needle-like member, and slides in a longitudinal direction relative to the first needle-like member, and a spring member that is joined to the first needle-like member and the second needle-like member, and applies an elastic force corresponding to a distance between the first needle-like member and the second needle-like member.--

On page 6, lines 22 - 31, please amend paragraph [0016] as follows:

--[0016] ~~According to claim 4, in~~ In the conductive contact ~~according to claim 3, the~~ second needle-like member includes a support member that is slidable in the longitudinal direction while being in contact with an inner circumference surface of the through hole formed in the first needle-like member, and a contact member that is integrally formed with the support member, and comes in electrical contact with the other of the to-be-contacted body, and the circuit or the circuit board during use.--

On page 6, line 31 to page 7 line 15, please amend paragraph [0017] as follows:

--[0017] ~~According to claim 5, a~~ A conductive contact unit includes a circuit that generates and transmits an electrical signal to be supplied to a to-be-contacted body or a circuit board that includes the circuit, a conductive contact including a needle-like member with a contact member that comes in contact with one of the to-be-contacted body, and the circuit or the circuit board

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

6

Docket No.: 80315(302753)

including the circuit during use, in which a portion coming in contact with the to-be-contacted body is processed into a predetermined shape, and a columnar member that is integrally formed with the contact member, and is formed with a through hole having a constant inner diameter or an inner diameter monotonically decreasing with distance from the contact member, and a spring member that biases the needle-like member in a direction perpendicular to the to-be-contacted body, and a conductive contact holder that includes a holder hole for accommodating the conductive contact.--

On page 7, line 17, please delete the subtitle as follows:

~~---EFFECT OF THE INVENTION---~~

On page 8, line 2 to page 9, line 11, please amend paragraph [0019] as follows:

--[0019]     ~~{Fig. 1}~~ Fig. 1 is a sectional view of the entire configuration of a conductive contact unit according to an embodiment of the present embodiment.

~~{Fig. 2}~~ Fig. 2 is a schematic of a configuration of the conductive contact constituting according to the embodiment.

~~{Fig. 3-1}~~ Fig. 3-1 is a schematic for explaining a manufacturing process of a first needle-like member constituting a conductive contact.

~~{Fig. 3-2}~~ Fig. 3-2 is a schematic for explaining the manufacturing process of the first needle-like member constituting the conductive contact.

~~{Fig. 3-3}~~ Fig. 3-3 is a schematic for explaining the manufacturing process of the first needle-like member constituting the conductive contact.

~~{Fig. 3-4}~~ Fig. 3-4 is a schematic for explaining the manufacturing process of the first needle-like member constituting the conductive contact.

~~{Fig. 3-5}~~ Fig. 3-5 is a schematic for explaining the manufacturing process of the first needle-like member constituting the conductive contact.

~~{Fig. 4}~~ Fig. 4 is a sectional view of a configuration of a conductive contact constituting

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

7

Docket No.: 80315(302753)

a conductive contact unit according to a first modified example.

~~{Fig. 5-1}~~ Fig. 5-1 is a schematic for explaining a manufacturing process of a needle-like member constituting the conductive contact in the first modified example.

~~{Fig. 5-2}~~ Fig. 5-2 is a schematic for explaining the manufacturing process of the needle-like member constituting the conductive contact in the first modified example.

~~{Fig. 6-1}~~ Fig. 6-1 is a schematic of the conductive contact being extended in the first modified example.

~~{Fig. 6-2}~~ Fig. 6-2 is a schematic of the conductive contact being contracted in the first modified example.

~~{Fig. 7}~~ Fig. 7 is a sectional view of a configuration of a conductive contact constituting a conductive contact unit according to a second modified example.

~~{Fig. 8}~~ Fig. 8 is a schematic of a configuration of a conventional conductive contact.--

On page 11, line 3, please amend the subtitle as follows:

-- ~~BEST MODE(S) FOR CARRYING OUT THE INVENTION~~ DETAILED DESCRIPTION OF AN EXEMPLARY EMBODIMENT--

On page 11, lines 4 - 13, please amend paragraph [0021] as follows:

--[0021] ~~Best mode (hereinafter referred to as "embodiment")~~ An exemplary embodiment of a needle-like member, a conductive contact, and a conductive contact unit according to the present invention will be described in detail below with reference to the drawings. Incidentally, the drawings are schematic only; note that relationship between thicknesses and widths of respective portions, proportion of thicknesses of respective portions, and the like are different from the actual ones. Naturally, relationship and proportion of sizes of respective portions vary among the drawings.--

On page 11, lines 14 - 22, please amend paragraph [0022] as follows:

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

8

Docket No.: 80315(302753)

--[0022] Fig. 1 is a sectional view of the entire configuration of a conductive contact unit according to an exemplary embodiment of the present invention. The conductive contact unit according to the exemplary embodiment includes a circuit board 2 with a circuit which generates a signal to be supplied to a semiconductor integrated circuit 1, a conductive contact holder 4 arranged on the circuit board 2 where a holder hole 3 is formed, and a conductive contact 5 accommodated in the holder hole 3.--

On page 11, lines 23 - 33, please amend paragraph [0023] as follows:

--[0023] The circuit board 2 ~~functions as an example of a circuit or a circuit board in the scope of the claims, and~~ includes an inspection circuit for inspecting electrical characteristics of the semiconductor integrated circuit 1 which is an inspection object. Specifically, the circuit formed on the circuit board 2 has a function to generate and transmit electrical signals for inspection. Furthermore, on a surface of the semiconductor integrated circuit 1 to contact the conductive contact holder 4, a connecting electrode 8 is arranged for electrically connecting the built-in inspection circuit to the conductive contact 5.--

On page 12, lines 6 - 16, please amend paragraph [0025] as follows:

--[0025] The holder holes 3 have a columnar shape, and is ~~are~~ formed to penetrate the conductive contact holder 4 correspondingly to an arrangement pattern of a plurality of the connecting electrodes 8 on the semiconductor integrated circuit 1 to be inspected. The holder holes 3 functions as a positioning unit and a guide unit for accommodating the conductive contact 5. The holder hole 3 is formed by applying etching, punching, or a laser beam, electron beam, ion beam, wire electric discharge, drilling, or the like to the respective first substrate 9 and the second substrate 10.--

On page 12, lines 17 - 32, please amend paragraph [0026] as follows:

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

9

Docket No.: 80315(302753)

--[0026] Furthermore, the holder hole 3 is formed so that the inner diameter is reduced near the upper and lower external surfaces of the conductive contact holder 4 so as to retain the conductive contact 5. That is, as to be described later, the conductive contact 5 has protruding members to be retained, and, when the conductive contact 5 extends, the protruding members are brought into contact with the narrow inner diameter of the holder hole 3 near the upper and lower surfaces of the conductive contact holder 4. The conductive contact holder 4 is formed by bonding the first substrate 9 and the second substrate 10 together to accommodate the conductive contact 5 in the holder hole 3 having the inner diameter reduced near the upper and lower external surfaces of the conductive contact holder 4 in the process of manufacturing the conductive contact unit according to the embodiment.--

On page 14, line 25 to page 15, line 8, please amend paragraph [0032] as follows:

--[0032] With the sharp-pointed portions 13c, the contact member 13b reduces electrical contact resistance between the contact member 13b and the connecting electrode 8. That is, as described above, the contact member 13b ensures conductivity with the connecting electrode 8 via the fine holes formed by the sharp-pointed portions 13c, and therefore, the contact area of one sharp-pointed portion 13c with the connecting electrode 8 is tiny. Therefore, the contact member 13b includes the sharp-pointed portions 13c to secure the contact area to some degree and reduce contact resistance. Additionally, with the sharp-pointed portions 13c, any one of the sharp-pointed portions 13c comes in contact with the connecting electrode 8 even when a position deviation occurs between the semiconductor integrated circuit 1 and the conductive contact unit according to the embodiment. Therefore, it is possible to reduce the probability of disconnection.--

On page 19, lines 4 - 42, please amend paragraph [0042] as follows:

--[0042] The spring member 12 exerts vertically elastic force on the first needle-like member 13 and the second needle-like member 14. Specifically, the spring member 12 has a predetermined spring constant. The spring member 12 is joined to the first needle-like member

DC 237124.1



Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

10

Docket No.: 80315(302753)

13 by press-fitting one end into the boss member 13f of the first needle-like member 13, and is joined to the second needle-like member 14 by press-fitting the other end into the boss member 14b of the second needle-like member 14, thereby exerting elastic force on both the members. Incidentally, because the spring member 12 is joined to the first needle-like member 13 and the second needle-like member 14, the spring member 12 can be made of a conductive material so that the first needle-like member 13 can be electrically connected to the second needle-like member 14 via the spring member 12. However, according to the exemplary embodiment, electrical conductivity is ensured by direct contact between the inner circumference surface of the through hole 13g in the first needle-like member 13 and the outer circumference surface of the support member 14a in the second needle-like member 14. Therefore, the spring member 12 need not be made of a conductive material, and can be made of, for example, an insulating material.--

On page 20, lines 1 - 14, please amend paragraph [0044] as follows:

--[0044] First, as shown in Fig. 3-1, the rod-like body 16 formed by a metal material and having a predetermined longitudinal direction is fixed by a gripping member 17. The gripping member 17 fixes the rod-like body 16, and also has a rotation mechanism (not shown in the drawing) so that a member to be gripped can rotate on a predetermined axis. As to be described later, when the first needle-like member 13 is manufactured, a process is performed while the rod-like body 16 is rotated on an axis with respect to the longitudinal direction thereof according to need. Therefore, in the embodiment, the rod-like body 16 is fixed so that a rotation axis of the gripping member 17 conforms to a central axis with respect to the longitudinal direction of the rod-like body 16.--

On page 20, lines 15 - 33, please amend paragraph [0045] as follows:

--[0045] Then, as shown in Fig. 3-2, a forming process for an outer circumference surface of the rod-like body 16 is performed while the rod-like body 16 is rotated by the gripping

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

11

Docket No.: 80315(302753)

member 17. Specifically, the outer circumference surface of the rod-like body 16 is formed by putting a grinding member 18 in contact with the outer circumference surface of the rotating rod-like body 16 by press force according to the outer circumference shape of the first needle-like member 13. Through the forming process, the outer circumference shape of components of the first needle-like member 13: the flange member 13d, the retaining protruding member 13e, and the boss member 13f, is formed. As described above, the rod-like body 16 rotates on the central axis with respect to the longitudinal direction thereof as the rotation axis. Therefore, outer circumference portions constituting the flange member 13d, the retaining protruding member 13e, and the boss member 13f are coaxially formed through the forming process illustrated in Fig. 3-2.--

On page 21, lines 12 - 24, please amend paragraph [0047] as follows:

--[0047] Then, as shown in Fig. 3-4, a forming process is performed by a grinding member 21 for a portion which constitutes the contact member 13b of the first needle-like member 13. When the contact member 13b has a shape shown in Fig. 2, a member capable of forming a V-shaped groove is used as the grinding member 21. After a V-shaped groove is formed by the grinding member 21 on the end surface of the rod-like body 16 to pass through the central axis of the rod-like body 16, the rod-like body 16 is rotated by 90 degrees to form another V-shaped groove. That is, the contact member 13b is formed by forming the V-shaped grooves intersecting at right angles each other on the end surface of the rod-like body 16 by the grinding member 21.--

On page 21, line 33 to page 22, line 15, please amend paragraph [0049] as follows:

--[0049] Next, advantages of the conductive contact unit according to the exemplary embodiment will be described. First, the conductive contact unit according to the exemplary embodiment has an advantage that the first needle-like member 13 can be easily manufactured. That is, as shown in Fig. 3-1 to 3-5, when the first needle-like member 13 is manufactured, it is

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

12

Docket No.: 80315(302753)

only required to perform the process from a single direction (the left side in Fig. 3-1 to Fig. 3-5) with respect to the rod-like body 16 after the rod-like body 16 is once fixed by the gripping member 17. Specifically, in the embodiment, to form the contact member 13b as shown in Fig. 3-4 while the rod-like body 16 is being fixed by the gripping member 17, the process is performed from the left side by the grinding member 21. Similarly, the process is performed from the left side by the drill 20 to form the hole portion 19 to be the through hole 13g.--

On page 22, lines 16 - 23, please amend paragraph [0050] as follows:

--[0050] Therefore, in the embodiment, the first needle-like member 13 can be manufactured without changing the direction of the rod-like body 16 (a member to be processed). As a result, in the conductive contact unit according to the exemplary embodiment, the first needle-like member 13 can be easily manufactured, and the axis deviation can be prevented. Therefore, a high-quality first needle-like member 13 can be easily manufactured.--

On page 22, line 24 to page 23, line 8, please amend paragraph [0051] as follows:

--[0051] The reason why such advantages can be achieved in the exemplary embodiment is that a hole in the first needle-like member 13 for accommodating the support member 14a of the second needle-like member 14 is of a through hole shape having a constant inner diameter. That is, when the hole portion formed in the first needle-like member 13 is formed in a cavity-like shape having the bottom as shown in Fig. 8, the hole portion is required to have an opening end at least on the second needle-like member 14 side, and therefore, the direction of the rod-like body 16 needs to be changed to form the hole portion. On the other hand, in the exemplary embodiment, the first needle-like member 13 has the structure in which the through hole 13g has the opening ends on both ends of the longitudinal direction, and therefore, drilling process in manufacturing with the drill 20 can be performed from the side opposite to the second needle-like member 14. With this structure, the aforementioned advantages can be achieved in the exemplary embodiment.--

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

13

Docket No.: 80315(302753)

On page 23, lines 9 - 21, please amend paragraph [0052] as follows:

--[0052] Further, the exemplary embodiment has other advantages with the structure in which the first needle-like member 13 includes the through hole 13g. That is, the first needle-like member 13 is used with the inner circumference surface of the through hole 13g being in contact with the outer circumference surface of the support member 14a of the second needle-like member 14, and requires less physical slide resistance and electrical contact resistance against the outer circumference surface of the support member 14a. Therefore, the inner circumference surface of the through hole 13g formed in the first needle-like member 13 needs to be smoothed, and surface finishing such as plating or the like is generally applied thereto.--

On page 23, line 22 to page 24, line 12, please amend paragraph [0053] as follows:

--[0053] When plating is used as surface finishing of the inner circumference surface of the through hole 13g formed in the first needle-like member 13, the plating can be uniformly applied over the entire inner circumference surface by forming the through hole 13g to have a plurality of opening ends. When the plating is performed, electrolytic plating or non-electrolytic plating is performed while the entire member as shown in Fig. 3-5 is being immersed in a plating liquid. The plating liquid used herein includes a liquid that contains, in a predetermined concentration, a metal ion to be attached to the inner circumference surface of the through hole 13g. On the other hand, as for liquid component of the plating liquid near the first needle-like member 13, a contained metal ion attaches to the surface of the first needle-like member 13 with progress of plating. Consequently, the metal ion concentration in the plating liquid component gradually lowers, and the efficiency of plating decreases. Therefore, when actual plating is performed, it is necessary to maintain a state where a fresh plating liquid component (i.e., containing a large number of metal ions) is always in contact with the surface of the first needle-like member 13 by, for example, performing plating while the plating liquid is being circulated.-

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

14

Docket No.: 80315(302753)

On page 24, lines 13 - 25, please amend paragraph [0054] as follows:

--[0054] Whereas, in the case of the conventional structure as shown in Fig. 8, even in a flowing plating liquid, it is difficult to maintain contact with a fresh plating liquid component, especially around the inner surface of the hollow portion 110. That is, the hollow portion 110 shown in Fig. 8 has only a single opening end on the side opposite to the contact member 108, and therefore, it is difficult to cause the fresh plating liquid component to flow into the inside of the hollow portion 110. Consequently, there is a possibility that, for example, the plating is thick near the opening end, and almost no plating takes place near the bottom of the hollow portion 110.--

On page 24, line 26 to page 25, line 6, please amend paragraph [0055] as follows:

--[0055] On the other hand, the first needle-like member 13 in the exemplary embodiment has a plurality of the opening ends because the through hole 13g is formed to penetrate the columnar member 13a. With this structure, a flowing plating liquid component flows in from one opening end and flows out from the other opening end, which allows the fresh plating liquid component to smoothly flow around the inner circumference surface of the through hole 13g. Therefore, in the conductive contact unit according to the exemplary embodiment, when the plating is applied to the first needle-like member 13, a fresh plating liquid can be always in contact with the inner circumference surface of the through hole 13g, and plating can be performed uniformly on the entire inner circumference surface.--

On page 25, lines 7 - 22, please amend paragraph [0056] as follows:

--[0056] Besides, as shown in Fig. 2, two opening ends of the first needle-like member 13 are formed on both ends in the longitudinal direction of the through hole 13g, which enables further smooth plating. That is, in the exemplary embodiment, two opening ends of the through hole 13g are formed on both sides in the longitudinal direction of the through hole 13g. As

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

15

Docket No.: 80315(302753)

described above, when the plating is performed, a fresh plating liquid flows from one of the two opening ends to the other. Because the two opening ends are formed on both ends in the longitudinal direction, the plating liquid uniformly flows inside the through hole 13g in the longitudinal direction. In other words, the fresh plating liquid flows in substantially the same amount at substantially the same speed, and plating is applied uniformly to the inner circumference surface. Thus, generation of thick plated portion can be suppressed.--

On page 25, line 23 to page 26, line 5, please amend paragraph [0057] as follows:

--[0057]

(First Modified Example)

Next, a first modified example of a conductive contact unit according to the exemplary embodiment will be described. In the first modified example, an inner diameter of a through hole formed in a first needle-like member forming a conductive contact is monotonically decreasing with distance from a contact member side. The term "Monotonically decreasing" as used herein is synonymous with mathematical meaning and, specifically, it indicates that the through hole is formed so that the inner diameter becomes the same or decreases with distance from near a contact member. More specifically, "the inner diameter of the through hole is monotonically decreasing with distance from the contact member side" indicates a state where the through hole is formed so that the following relationship is formed:--

On page 26, lines 12 - 24, please amend paragraph [0059] as follows:

--[0059] Fig. 4 is a schematic of the entire configuration of a conductive contact constituting a conductive contact unit according to the first modified example. As shown in Fig. 4, in the first modified example, a spring member 12 and a second needle-like member 14 have the same configuration as those of Fig. 2. Whereas, a first needle-like member 22 is of different configuration from that shown in Fig. 2 in that a through hole 22a is formed in the longitudinal direction near a contact member 13b, a first hole portion 22b having an inner diameter  $d_1$  is formed, and a second hole portion 22c having an inner diameter  $d_2 (< d_1)$  is formed on the side

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

16

Docket No.: 80315(302753)

opposite to the contact member 13b with respect to the first hole portion 22b.--

On page 27, line 32 to page 28, line 10, please amend paragraph [0064] as follows:

--[0064] As described above, the advantages of the present invention can be achieved not only when the through hole is formed to have the same inner diameter, but also when the inner diameter is monotonically decreasing with distance from the contact member 13b side. That is, as shown in Fig. 5-1 and Fig. 5-2, the direction ~~or the like~~ of the rod-like body 24 need not be changed when the hole portion 27 and the hole portion 29 are formed. As in the exemplary embodiment, a high-quality first needle-like member 22 can be easily manufactured. Moreover, as in the exemplary embodiment, the through hole 22a has two opening ends, and therefore, there is an advantage that uniform plating can be achieved.--

On page 28, lines 11 - 15, please amend paragraph [0065] as follows:

--[0065] Further, the conductive contact unit of the first modified example has advantages other than those of the conductive contact unit according to the exemplary embodiment. Such advantage will be described referring to the drawings as required.--

On page 28, lines 16 - 23, please amend paragraph [0066] as follows:

--[0066] Fig. 6-1 and Fig. 6-2 are schematics for explaining the advantages of the conductive contact according to the first modified example. Fig. 6-1 depicts the conductive contact which is ~~the most~~ completely extended in the longitudinal direction; Fig. 6-2 depicts the conductive contact which is ~~the most~~ completely contracted in the longitudinal direction. In Fig. 6-1 and Fig. 6-2, a spring member 12 is not shown in order to facilitate understanding.--

On page 28, line 24 to page 29, line 4 please amend paragraph [0067] as follows:

--[0067] In the state shown in Fig. 6-1, in the conductive contact according to the first

DC 237124.1

Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

17

Docket No.: 80315(302753)

modified example an outer circumference surface of a support member 14a is in contact with an inner circumference surface of a second hole portion 22c, and is not in contact with an inner circumference surface of a first hole portion 22b. Accordingly, when the conductive contact is ~~the most~~ completely extended in the longitudinal direction as shown in Fig. 6-1, a region in which the inner circumference surface of the through hole 22a is in contact with the support member 14a has a length of the longitudinal direction of the second hole portion 22c with respect to the longitudinal direction of the conductive contact, that is, a length  $d_3$  shown in Fig. 6-1.--

On page 29, lines 5 - 22, please amend paragraph [0068] as follows:

--[0068] Next, as shown in Fig. 6-2, the state where the conductive contact is ~~the most~~ completely contracted in the longitudinal direction will be discussed. In such a case, as compared with Fig. 6-1, a length in the longitudinal direction of the support member 14a inserted in the through hole 22a lengthens, whereas, because the inner circumference surface of the first hole portion 22b does not come in contact with the outer circumference surface of the support member 14a, a region coming in contact with the inner circumference surface of the through hole 22a has a length of the longitudinal direction of the second hole portion 22c with respect to the longitudinal direction of the conductive contact, that is, the length  $d_3$ . In other words, in the conductive contact of the first modified example, a contact area between the first needle-like member 22 and the second needle-like member 14 does not change when the conductive contact is extended and contracted.--

On page 29, line 23 to page 30, line 1 please amend paragraph [0069] as follows:

--[0069] As already described, in the conductive contacts according to the exemplary embodiment and the first modified example, the outer circumference surface of the support member 14a in the second needle-like member 14 is in contact with the inner circumference surface of the through hole formed in the first needle-like member to ensure electrical conductivity between the first needle-like member and the second needle-like member 14. Accordingly, an electrical contact resistance between both the members changes depending on a

DC 237124.1



Application No. 10/588,311  
Amendment dated January 17, 2008  
Reply to Office Action of July 20, 2007

18

Docket No.: 80315(302753)

contact area between the outer circumference surface of the support member 14a and the inner circumference surface of the through hole.--

On page 31, lines 16 - 26, please amend paragraph [0074] as follows:

--[0074] In addition, ~~it is needless to say that~~ the through hole 22a formed in the first needle-like member 22 in the first modified example is not limited to the one shown in Fig. 4. That is, examples of the first needle-like member 22 in the first modified example include all those having a through hole with an inner diameter that monotonically decreases with distance from a contact member, i.e., that changes to satisfy the relationship of Equation 1. Therefore, a through hole in, for example, a tapered shape can be used whose inner diameter decreases at a constant rate with distance from a contact member.--

On page 33, line 1, please delete the subtitle as follows:

--~~INDUSTRIAL APPLICABILITY~~--

DC 237124.1